

GUSAKOVSKIY, Zakhariy Pavlovich; OCHKIN, Vasiliy Alekseyevich;
ADAMOVSKIY, I.I., retsenzent; UR'YASH, F.G., retsenzent;
BELOUSOV, D.P., spets. red.; KORBUT, L.V., red.

[Technology of canned meat] Tekhnologiya miasnykh kon-
servov. Moskva, Pishchevaia promyshlennost', 1964. 293 p.
(MIRA 17:10)

GUSALOV, A.Kh.

Winter camps for students. Zdorov'e } no.1:11 Ja '57. (MIRA 10:2)

1. Starshiy prepodavatel' Moskovskogo neftyanogo instituta
imeni Gubkina.
(CAMPING)

GUSALOV, A.Kh.

How does one fight fatigue? Zdorov'e 5 no.2:30 F '59.
(MIRA 12:2)

(Fatigue)

GUSALOV, Kh.P.; KHACHETLOV, R.M.

Mechanized saturation irrigation along long strips. Gidr. i mel.
17 no.2:4-8 F '65. (MIRA 18:5)

1. Kabardino-Balkarskaya sel'skokhozyaystvennaya opyt'naya stantsiya.

CHIBIROV, Khristofor Tadeozovich; GUSALOV, Nikolay Aleksandrovich; DZUSKAYEV, K.B., red.; DATRIYEVA, Ye.M., tekhn. red.

[Northern Ossetia in the seven-year plan] Severnaia Osetiia v semi-
letke. Ordzhonikidze, Severo-Osetinskoe knizhnoe izd-vo, 1960. 36 p.
(MIRA 14:12)

(Ossetia--Economic conditions)

GUSALOV, Z.G., gornyy inzh.; KONOVALOV, N.N., gornyy inzh.; YEGIN, B.,
gornyy inzh.

Operations at the Almalyk open-pit mine. Ugol' 40 no.12:38-40
D '65. (MIRA 18:12)

GUSAMI, G. M. Cand Med Sci -- (diss) "Bandaging external iliac
veins during compensated mitral vitium cordis," Moscow, 1960, 19 pp,
250 cop. (First Moscow Medical Institute im I. M. Sechenov) (KL, 42-60, 116)

GUSAMI, G.M.

Change in venous pressure and circulation time after ligation of
the external iliac veins in decompensating mitral defects of the
heart. Khirurgiia 36 no.3:41-46 Mr '60. (MIRA 13:12)
(MITRAL VALVE—SURGERY) (BLOOD PRESSURE)
(BLOOD—CIRCULATION) (ILIAC VEIN—LIGATURE)

5(3)

AUTHORS:

Gostunskaya, I. V., Gusar, N. I., SOV/20-123-5-23/50
Leonova, A. I., Kazanskiy, B. A., Academician

TITLE:

The Reduction of Diene Hydrocarbons With a Conjugate System of Double Bonds by Hydrogen at the "Instant of Its Liberation" (Vosstanovleniya diyenovykh uglevodorodov s sopryazhennoy sistemoy dvoynnykh svyazey podorodom "moment vydeleniya")

PERIODICAL:

Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 5, pp 853-856 (USSR)

ABSTRACT:

Hydrogen at the instant of its liberation is capable of attaching itself to the diene hydrocarbons, not only in the 1.4-position, but also in the 1.2-and 3.4-positions (Refs 1-6). The sequence of the attachment depends on the structure of the diene. The attachment in the 1.2-and 3.4-positions is favored by the larger number of alkyl groups in the 1st and 4th terminal carbon atoms (di-isocrotyl and 2-methyl-hexadiene-2.4): the alkyl groups at the 2nd and 3rd atoms of the conjugate system have the same effect with regard to the 1.4-position (isoprene and di-isopropenyl). By the reduction with sodium solution in liquid ammonia (Refs 1-4) or with calcium-hexa-ammoniate (Refs 5-6), metal amides are formed

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simultaneously with the hydrogen attachment to the double bond. It has recently become clear that the amides are capable of catalysing the displacement of the double bonds in mono- and diolefin hydrocarbons (Refs 7-10). Consequently, it could be expected that under certain conditions the structure of mono-olefins resulting from the attachment of a hydrogen molecule to the dienes should depend, not only on the structure of the initial diene, but also on the secondary reaction of the isomerization under the influence of the resulting metal amide. In order to eliminate the isomerizing effect of the metal amide, ethyl alcohol was added to the sodium solution in liquid ammonia (Ref 1). Besides, di-isopropenyl was reduced by calcium-hexa-ammoniate, and di-isocrotyl was reduced by sodium in liquid ammonia (Ref 2). The results are shown in table 1. From this it can be seen that on the reduction from all its sources at the moment of its liberation, hydrogen is attached almost exclusively in the 1.4-position of di-isopropenyl. The reduction of di-isocrotyl is less selective, although hydrogen is attached here in the 1.2-positions. From a comparison of the data for calcium-hexa-

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ammoniate as well as for sodium solution in liquid ammonia with those for the latter solution to which, however, ethanol has been added, it can be seen that although the secondary isomerization reaction somewhat modifies the results of the primary reaction, it does not distort them. Thus the rules governing the effect of the structure of dienes on the direction of their reduction, as specified in the papers by Levina, Kazanskiy, and collaborators, remain valid. There are 2 figures, 7 tables, and 16 references, 15 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova
(Moscow State University imeni M. V. Lomonosov)

SUBMITTED: August 5, 1958

Card 3/3

VILENSKIY, Yu.B.; VERSTENOVA, T.N.; LEVI, S.M.; GUSAR', N.I.;
DUSHEYKO, D.A.

Investigating the hardening properties of α, β -dichloro- and
 α, β -dibromoformylacrylic acids. Zhur.nauch.i prikl.fot. i kin.
6 no.5:334-337 S-O '61. (MIRA 14:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut
(NIKFI).

(Photographic emulsions)

L 51812-65 EWP(m)/EPF(c)/EPR/EWP(j)/T/ Pc-L/Pr-L/Ps-L WW/RM

ACCESSION NR: AP5017011

UR/0204/64/004/006/0819/0823

AUTHOR: Plate, A. F.; Gusev, M. I.; Belikova, N. A.; Sterin, Kh. Ye.

TITLE: Hydrogenolysis and pyrolysis of bicyclo-(3,2,0)-heptane

SOURCE: Neftekhimiya, v. 4, no. 6, 1964, 819-823

TOPIC TAGS: heptane, hydrogenation, pyrolysis, catalysis, cyclic group

ABSTRACT: Hydrogenolysis of bicyclo-(3,2,0)-heptane on platinized charcoal begins at 100° and goes almost to completion at 150°, forming ethylcyclopentane (49%), cycloheptane (44%), and trans-1,2-dimethylcyclopentane (7%). In the presence of nickel-on-kieselguhr, complete hydrogenolysis of bicyclo-(3,2,0)-heptane takes place at 110°, resulting in the formation of ethylcyclopentane (50%), cyclopentane (20%), and trans-1,2-dimethylcyclopentane (28%). The carrier, kieselguhr, does not catalyze the conversion of bicyclo-(3,2,0)-heptane. Formation of the trans-isomer of 1,2-dimethylcyclopentane was explained by conversion of the cis-isomer originally formed, at the reaction temperature. In a study of the behavior of bicyclo-(3,2,0)-heptane under conditions of catalytic isomerization on platinized charcoal (in the absence of hydrogen), the hydrocarbon remained stable up to 250°, and cleavage of the cyclobutane

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ring occurred to an extent of only 14% at 350°. In the absence of a catalyst, pyrolysis does not begin at temperatures below 450°; at 500°, bicyclo-(3,2,0)-heptane is 15% decomposed, while at 550° the decomposition goes to completion. The pyrolysis products at 500°, after hydrogenation, contained the initial hydrocarbon, 6-7% cyclopentane, and 7-8% n-heptane. The pyrolyzate obtained at 550° represented a complex mixture: after hydrogenation, n-pentane, isopentane, cyclopentane, n-heptane, trans-1,2-dimethylcycloheptane, ethylcyclopentane, a few aromatic compounds, and the initial bicyclo-(3,2,0)-heptane were found; the gas formed in the decomposition contained 80% ethylene and an admixture of methane and hydrogen. Orig. art. has: 2 formulas, 3 tables.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University); Komissiya po spektroskopii AN SSSR (Spectroscopy Commission,

AN SSSR)

SUBMITTED: 12Jun64

ENCL: 00

SUB CODE: 00, 00

NO REF EOV: 006

OTHER: 002

JPRS

2/2
Card

PLATE, A.F.; MELIKOVA, N.A.; BOBYKOVA, N.A.; GILMAN', N.I.; VITI, L.V.

Isomerization of bicyclic $C_{10}H_{16}$ hydrocarbons in the presence of $AlCl_3$. Dokl. AN SSSR 163 no.4:902-905 Ag '65.

(MIRA 18:8)

1. Moskovskiy gosudarstvennyy universitet i Institut elementoorganicheskikh soedineniy AN SSSR. Submitted January 16, 1965.

TELETYPE, 6/24/64, 10:00 AM

Reduction of oxides by sodium in liquid ammonia. *Izv. Akad. Nauk SSSR, Khim. Obshch.* 35 no. 1: 14-15, Jan. 1966.

Reduction of oxides by sodium in liquid ammonia. Part. 2.
Ibid.:129-131 (MIRA 18:2)

FEL'DMAN, A.L.; GUSAR, Z.D.; KATSEVICH, A.I.

Preparation of canned plums from the Early Siniukha variety.
Kons. i ov.prom. 18 no.9:8-9 S '63. (MIRA 16:9)

1. Odesskiy tekhnologicheskii institut pishchevoy i kholodil'noy
promyshlennosti.

(Fruit, Canned)

VORONITSYN, K.I., kand. tekhn. nauk, red.; TIZENGAUZEN, P.E., kand. tekhn. nauk, red.; NADBAKH, M.P., red.; TANTSEV, A.A., starshiy nauchnyy sotr., red.; ABRAMOV, S.A., kand. tekhn. nauk, red.; ABRAMOV, D.A., red.; BOGDANOV, N.I., starshiy nauchnyy sotr., red.; VINOGRADOV, G.K., kand. tekhn. nauk, red.; GAVRILOV, I.I., starshiy nauchnyy sotr., red.; GUSARCHUK, D.M., starshiy nauchnyy sotr., red.; D'YAKONOV, A.I., red.; ZAV'YALOV, M.A., kand. tekhn. nauk, red.; ZARETSKIY, M.S., starshiy nauchnyy sotr., red.; KACHELKIN, L.I., starshiy nauchnyy sotr., red.; KISHINSKIY, M.I., kand. tekhn. nauk, red.; KOLTUNOV, B.Ya., starshiy nauchnyy sotr., red.; OSIPOV, A.I., kand. tekhn. nauk, red.; SHINEV, I.S., kand. ekon. nauk, red.

[Materials of the enlarged session of the Scientific Council of the Central Scientific Research Institute for Mechanization and Power Engineering in Lumbering on problems concerning power engineering and the electrification of the lumber industry]
Materialy rasshirennoi sessii Uchenogo soveta TsNII ME po voprosu energetiki i elektrifikatsii lesnoi promyshlennosti. Moskva, 1961. 75 p. (MIRA 15:4)

(Continued on next card)

VORONITSYN, K.I.---(continued) Card 2.

1. Khimki. Tsentral'nyy nauchno-issledovatel'skiy institut mekhanizatsii i energetiki lesnoy promyshlennosti. 2. Nachal'nik Tsentral'nogo byuro tekhnicheskoy informatsii lesnoy promyshlennosti (for Nadbakh). 3. Direktor Tsentral'nogo nauchno-issledovatel'skogo instituta mekhanizatsii i energetiki lesnoy promyshlennosti (for Voronitsyn). 4. Uchenyy sovet Tsentral'nogo nauchno-issledovatel'skogo instituta mekhanizatsii i energetiki lesnoy promyshlennosti (for D'yakonov). 5. Nachal'nik otdeleniya energetiki i sredstv avtomatizatsii Tsentral'nogo nauchno-issledovatel'skogo instituta mekhanizatsii i energetiki lesnoy promyshlennosti (for Zaretskiy).
(Lumbering) (Electric power)

KACHELKIN, Leonid Ivanovich; GUSARCHUK, D.M., red.; KSENOFONTOV, I.A., red.; YASINSKIY, B.N., red.; MYAKUSHKO, V.P., red.izd-va; SHIBKOVA, R.Ye., tekhn.red.

[Complete utilization of wood waste] Kompleksnoe ispol'zovanie
otkhodov drevesiny. Moskva, Goslesbumizdat, 1961. 201 p.
(MIRA 15:5)

1. Moscow. Vystavka dostizheniy narodnogo khozyaystva SSSR.
2. Tsentral'nyy nauchno-issledovatel'skiy institut mekhanizatsii i energetiki lesnoy promyshlennosti (for Kachelkin).
(Wood-using industries)
(Wood waster)

VASIL'YEV, Boris Aleksandrovich; KOMAROV, Yuriy Semenovich; PAVLOV,
Boris Ivanovich; GUSARCHUK, D.M., red.; PITERMAN, Ye.L.,
red.izd-va; KARLOVA, G.L., tekhn.red.

[Automation of production processes in the lumbering
industry] Avtomatizatsiia proizvodstvennykh protsessov v
lesnoi promyshlennosti. Moskva, Goslesbumizdat, 1963. 184 p.
(MIRA 16:10)

(Lumbering--Machinery) (Automatic control)

IVANOV, Georgiy Petrovich; GUSARCHUK, D.M., red.; MYAKUSHKO,
V.P., red.izd-va; SHIBAKOVA, P.Ye., tekhn. red.

[Recent developments in the technology of the Antropovo
Logging Camp; practices in the biological drying of the
wood of hardwood species] Novoe v tekhnologii Antropov-
skogo lespromkhoza; iz opyta biologicheskoi sushki dreve-
siny listvennykh porod. Moskva, Goslesbumizdat, 1962. 34 p.
(MIRA 17:4)

GUSARENKO, A.N.; MATVEYEV, V.M., kand.tekhn.nauk

Welding of connections during the installation of pipes on ships.
Sudostroenie 26 no.9:60-62 S'60. (MIRA 13:10)
(Marine pipe fitting) (Welding)

SERGEYEVICH, V.I.; ZHUZE, T.P.; ZAKS, S.L.; BURMISTROVA, V.F.;
GUSAREV, A.V.

Regularities in the flooding of oil from reservoir rocks with
compressed gases in a model reservoir. Neft. khoz. 41 no.2:29-35
F '63. (MIRA 17:8)

GUSAREV, B.I. (g. Sumy)

Studying the topic "Machines operating on three-phase alternating
current." Politekh.obuch. no.12:45-48 D '58. (MIRA 11:12)
(Electric machinery--Polyphase--Study and teaching)

GUSAREVA, E.V.

Innervation of the myocardium following its stimulated regeneration.
Dokl. AN SSSR 164 no.5:1190-1193 O '65.

(MIRA 18:10)

1. Institut morfologii zhivotnykh Im. A.N.Savchenko AN SSSR.
Submitted December 21, 1964.

GNILORYBOV, T.Ye., zasluzhennyy deyatel' nauki USSR, professor; GUSAREV, V.F.,

Dermoplasty in trophic ulcers [with summary in English, p.160]
Vest.khir. 77 no.6:99-103 Je '56. (MLRA 9:8)

1. Is gosptal'noy khirurgicheskoy kliniki (zav. - prof. T.Ye. Gnilyorbov) Dnepropetrovskogo meditsinskogo instituta. Dnepropetrovsk, pr. K.Marksa, d.2-a, kv. 59.

(ULCER, surgery.

skin transpl. (Rus))

(SKIN TRANSPLANTATION, in various diseases,
ulcer (Rus))

QUSARBY, V.F.

Foreign body of the bladder and urethra. Nov.khir.arkh. no.2:79
Mr-Ap '57. (MIRA 10:8)

1. Kafedra fakul'tetskoy khirurgii Dnepropetrovskogo meditsinskogo
instituta
(BLADDER--FOREIGN BODIES) (URETHRA--FOREIGN BODIES)

GUSAREV, V.F.

GUSAREV, V.F.

Primary skin grafting in loss of skin from the fingers and hand.
Ortop.travm. i protez. 18 no.3:67 My-Je '57. (HLEA 10:9)

1. Iz fakul'tetskoy khirurgicheskoy kliniki (zav. - prof. M.F.
Kamavov) Dnepropetrovskogo meditsinskogo instituta (dir. - prof.
D.P. Chukhriyenko)

(SKIN GRAFTING) (HAND--WOUNDS AND INJURIES)

USSR/General Problems of Pathology. Transplantation of
Tiscucs and Tissue Therapy.

U-2

Abs Jour : Ref Zhur - Biol., No 20, 1950, No 93808

Author : Gusarev, V. F.
Inst : Dnepropetrovsk Medical Institute
Title : Variation in the Temperature of the Skin and the Vascular
Tone in Transplanted Skin Flaps at the Site of Trophic Ulvers.

Orig Pub : Sb. nauchn. tr. Dnepropetr. med. in-ta, 1957, 3, 86-87.

Abstract : The temperature of grafted skin flaps (f) was surveyed in
35 patients after plastic surgery by the Filatov method and
the Italian or bridge method. In the first 6 months the tem-
perature of the skin F increased by 0.5 - 0.5 degrees from
the periphery to the center. The temperature of the skin
surrounding F was 1-2 degrees below the temperature of the
periphery of F. In the course of 1 year a rise of 1 degree

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USSR/General Problems of Pathology. Transplantation of
Tissues and Tissue Therapy.

U-2

Abs Jour : Ref Zhur - Bioll, No 20, 1958, No 93808

was noted in the temperature of F; furthermore, the temperature could be explained by paralytic conditions of the blood vessels as a result of their denervation. In cases of impairment of the trophical system this elevation was observed for as long as 20 years. -- K. T. Markuze.

Card 2/2

GUSAREV, V.F. (Dnepropetrovsk, ul. Dzerzhinskogo, d.10, kv.3.); TROFIMOV, V.L.

Treatment of intestinal obstruction in atresia of newborn infants.
Vest.khir. 80 no.1:124-126 Ja '58. (MIRA 11:4)

1. Iz gosspital'noy khirurgicheskoy kliniki (zav. - prof. T.Ye. Gnilyorhov) lechebnogo fakul'teta i fakul'tetskoy khirurgicheskoy kliniki (zav. - prof. M.F.Kamayev) pediatricheskogo i sanitarno-gigiyenicheskogo fakul'tetov Dnepropetrovskogo meditsinskogo instituta.

(INTESTINES, abnorm.

atresia in newborn causing intestinal obstruct., surg.
(Rus))

(INTESTINAL OBSTRUCTION, etiol. & pathogen.

atresia of intestine in newborn, surg. (Rus))

(INFANT, NEWBORN, dis.

intestinal obstruct. in atresia, surg. (Rus))

GUSAREV, V. E., Cand. Medic. Sci. "Direct and Long-range Results of Plastic Operations for Trophic Ulcers by Attached Skin Flap. (Clinical-experimental Investigation)," Minsk, 1961, 15 pp. (Minsk Med. Inst.) 120 copies (KL Supp 12-61, 284).

GUSAREV, V.F., assistant (Zaporozh'ye, ul. Krasnogvardeyskaya, d.38,
kv.16); LOMAKIN, M.M.; KASHICHENKO, V.G.

Comparative evaluation of different types of endotracheal potenti-
alized anesthesia. Klin.khir. no.9&49-52 S '62. (MIRA 16*5)

1. Khirurgicheskoye otdeleniye (zav. - Ye.N. Knysh) Klinicheskoy
bol'nitsy No.3 g. Zaporozh'ya.
(INTRATRACHEAL ANESTHESIA)

GUSAROV, V.F.; SHNEVARCH, I.I.

Outline of the methodology of studying the functional status in resection of the stomach. Khirurgiya (S. no. 9:53-5) S 164.
(MIRA 18:2)

1. 2-ya kafedra khirurgii (zav. - prof. R.F. Kaplan) Zaporozhskogo instituta usovercheniivovreniya vrachev.

G.NILORYBOV, T.Ye., zasluzhennyy deyatel' nauki UkrSSR, prof. (Minsk, Mogilevskoye shosse, d.1-b, kv.20); GUSAREV, V.F., kand. med. nauk

Methods of skin grafting in contractures and cicatrices following burns. Ortop., travm. i protez. 26 no.1:45-47 Ja '65.
(MIRA 18:5)

CUSAREVA, E.V.

Regeneration of nerve elements of the left ventricle after its
injury by diathermocoagulation. Dokl. AN SSSR 157 no.3:733-736
Jl '64. (MIRA 17:7)

1. Institut morfologii zhivotnykh imeni A.N. Severtova.
Predstavleno akademikom A.N. Bakulevym.

STURGEON, A. A.

"Investigation of the non-stationary passage through the critical speed of a flexible rotor with two non-equilibrated masses." Acad Sci USSR. Inst of Machine Science. Moscow, 1956. (Dissertation for the Degree of Candidate in Technical Sciences).

SO: Knizhnaya letopis', No. 16, 1956

GUSAROV, A.A.

18(7); 25(2) P.5 PHASE I BOOK EXPLOITATION SOV/2561

Akademiya nauk SSSR. Institut mashinovedeniya

Problemy prochnosti v mashinostroyeni, vyp. 1 (Problems of Strength in Machinery Construction, No. 1) Moscow, Izd-vo AN SSSR, 1958. 105 p. 3,000 copies printed.

Resp. Ed.: S.V. Serensen, Academician, Academy of Sciences, UkrSSR; Ed. of Publishing House: V.I. Mitin; Tech. Ed.: O.M. Gus'kova.

PURPOSE: This collection of articles is intended for scientific research workers and engineers concerned with problems of vibrations in revolving shafts.

COVERAGE: This collection of articles deals with vibrations in rotary motion. Topics discussed include the influence of internal friction on the vibrational stability of revolving shafts, nonlinear vibration of shafts beyond critical speeds, flexural unsteady-state vibrations of a flexible rotor with

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Problems of Strength in Machinery (Cont.) SOV/2561

two equal unbalanced masses, and flexural unsteady-state vibrations of flexibly supported rotors, taking the gyroscopic effect into account. No personalities are mentioned. References follow several of the articles.

TABLE OF CONTENTS:

Poznyak, E.L. Effect of Resistance Forces on the Stability of Rotating Shafts

3

The author discusses the effect of internal friction and similar forces (e.g., friction between hub and shaft) on the stability of rotating shafts subjected to very small disturbances. An experimental investigation of stability is described, and the results are analyzed.

Bolotin, V.V. Nonlinear Vibrations of Shafts Beyond Critical Speeds of Rotation

25

The purpose of the investigation presented in this article is to obtain general patterns for the effect

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Problems of Strength in Machinery (Cont.)

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of internal friction in rotating shafts at speeds of rotation above the critical. The author analyzes the rotation of a single-disk weightless shaft vibrating at a frequency low enough to exclude the possibility of deviation of the disk.

(Gusarov, A.A. Flexural Unsteady-state Vibrations of a Flexible Rotor With Two Equal Unbalanced Masses

54

The author uses a previously obtained solution for the analysis of the transition through critical speeds of a shaft with two disks of equal weight, placed equidistant from the supports, and having differently located disbalance vectors. Two cases are discussed; 1) when the eccentricities of the disks are equal, and 2) when they are unequal. The use of the results for the dynamic balancing of flexible rotors with two equal masses is explained.

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Problems of Strength in Machinery (Cont.)

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Grobov, V.A. Unsteady-state Flexural Vibrations of
Elastically Supported Rotors, Taking the Gyroscopic Effect
Into Account

88

This article is an investigation of the relationship between gyroscopic effect and unsteady-state transverse vibrations of rotors with flexible shafts on elastic bearings during transition through critical speeds. Two cases are treated, one in which the elastic supports have a linear characteristic with equal or different radial rigidity, and one in which one support is rigid, the other is elastic with a nonlinear characteristic, and the coefficients of radial rigidity are the same.

AVAILABLE: Library of Congress

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GO/mg
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GUSAROV, A.A., kand. tekhn. nauk; DIMENTBERG, F.M., doktor tekhn. nauk.

Balancing flexible shafts. Vest. mash. 39 no.1:47-53 Ja '58.
(MIRA 12:1)

(Balancing of machinery)

29(2): 24(6)

PLATE 1 BOOK EXTRACTS

5/7/991

Abdennayr and SSM. Inelastic machine dynamics
Koblenz v turbomashinoy abnormal stress (Vibrations in Turbomachinery)
Collection of 2,000 copies printed.
Inserted: 2,000 copies printed.

Boop, M. J. V. Foreman, Academician, Academy of Sciences, USSR; M. of
Publishing House: Ye. A. Gilevich; Tech. M.: V. 7, Vol. 10.

PURPOSE: This collection of articles is intended for scientific research workers,
engineers, and designers in the field of turbomachinery.

CONTENTS: This collection of articles deals with vibrations in turbomachinery.
The following topics are discussed: vibrations and stability of bases, flexural
bearing of a turbopump rotor, vibrations and stability of a flexible rotor with two
vibrations of a rotating shaft, whipping speed of a flexible rotor with two
vibrations of a rotating shaft, acceleration through dynamic stresses in blades of an
unbalanced rotor, and damping of vibrations in a turbine. No preambles are included.

References follow several of the articles.
Berg, M. L., P. M. Dimentberg, A. S. Gilyevich, G. I. Lydin, M. A. Pribludnyy,
M. A. Pribludnyy, Investigation of Vibrations and Stresses in the
Rotor and Bearings of a High-Speed Turbopump During Operation
The authors discuss an experimental investigation made on a high-speed
turbopump rotor in order to analyze the real state of stress of the
rotor and bearings. The dynamic behavior of the
whole system of rotor and bearings is treated. The influence of
base and foundation are not taken into consideration.

Bojarski, Z. J. Vibration and Stability of Bases Under Action of Nonconservative
Vibrations
The authors discuss the problem of vibration of a base under the action of
vibrations of a base. The problem is solved by the method of stability
analysis. The results of the analysis are presented. The influence of
the base on the stability of the system is discussed.

Chernykh, A. L. Acceleration Through Critical Speeds of a Flexible Rotor
The author derives a system of two coupled differential equations as a
result of the analysis of the problem. The solution is based on the following assump-
tions: that the mass of the shaft, the gyroscopic moments of the
blades, and the mass of the rotor are neglected. The initial deflections of the
shaft are neglected. It is assumed that the shaft supports are absolutely rigid and
the shaft itself is torsionally rigid and that the excitation through
critical speeds is uniform.

Bobak, V. F. Acceleration Through Resonance in One Case of a Nonlinear
System
The authors discuss the problem of acceleration through resonance in one case of a nonlinear
system. The problem is solved by the method of stability analysis. The results of the
analysis are presented. The influence of the base on the stability of the system is
discussed.

Babitskiy, V. Ya. (Deceased). Critical Speeds of a Rotor and Clearances in
Bearings
The effect of the clearance in rolling contact bearings on the motion and
whirling speed of a rotor is discussed. Results of an experimental investigation for
selecting eccentricities of disks.

Buzanov, Ye. I. Investigation of Dynamic Stresses in Blades of an Axial
Compressor With a Wide Control Range
The basic results of an experimental investigation of dynamic stresses in
blades of an axial compressor are presented. The behavior of the blades
placed in the root sections is described.

Sergeyev, S. I. Damping of Vibrations of Anisotropic Elastic Rotor
Coefficients for successful damping of a rotor with unequal elasticity
coefficients along its principal axes are discussed. The inertia and
coefficients along its principal axes are discussed.

Gusarov, A. A.

SCV/ANB

Akademika mark 8888. Institut mashinovedeniya

Voprosy prochnosti materialov i konstruktivnykh problem (Problems of Strength of Materials and Structures) Moscow, 1959. 399 p. Errata slip inserted. 3,200 copies printed.

Bary, M. I. D. E. Babakov, Professor, Doctor of Technical Sciences; Ed. of Publishing House: G. B. Gorbunov; Tech. Ed.: S. I. Shilin.

PURPOSE: This book is intended for engineers and scientists concerned with the problems of the strength of materials and construction.

COVERAGE: The book contains 28 articles on the strength of materials in general and of machine construction in particular. This collection was prepared under the direction of the Institute of Mechanical Engineering of the AS USSR in honor of Professor Vladimir Borisovich, one of the founders and directors of the original school of strength of materials, who recently completed 30 years of scientific activity. The Preface gives a short history of his life and professional activities. The collection is divided into two parts. The first part contains 13 articles on general problems of strength and the strength of machine construction materials. The second part contains 15 articles on dynamics and calculation of strength and rigidity. There are references at the end of each article.

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AVAILABLE: Library of Congress

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6-57-00

PHASE I BOOK EXPLOITATION SOV/4415

Akademiya nauk SSSR. Institut mashinovedeniya

Problemy prochnosti v mashinostroyeni, vyp. 6 (Problems of Strength in Machine Building No. 6) Moscow, 1960. 87 p. 3,000 copies printed.

Resp. Ed.: F. M. Dimentberg, Doctor of Technical Sciences;
Ed. of Publishing House: P. R. Zolotov; Tech. Ed.: I. F. Koval'skaya.

PURPOSE: This collection of articles is intended for engineers dealing with the problem of machine vibrations.

COVERAGE: The collection contains works which were originally presented at the Uchenyy sovet i Seminar prochnosti Instituta mashinovedeniya AN SSSR (Scientific Council and Seminar for Strength Research of the Institute of Science of Machines, Academy of Sciences USSR), in 1958-59. The following problems are investigated: vibrations in machines, balancing of flexible rotors (taking friction into account), the effect of impulses on flexible shaft connected to the engine, vibra-

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Problems of Strength (Cont.)

SOV/4415

tion of a shaft with clearance, determination of frequency and mode of free vibrations of variable cross-section bars by means of special functions, and the calculation of self-excited vibrations in a computer system. No personalities are mentioned. References accompany individual articles.

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Sergeyev, V. I. Calculation of Self-Excited Vibrations in the Presence of Clearance and Coulomb Damping in the System of the Automated Drive of Bridge-Type Computers 55

Banakh, L. Ya., F. M. Dimentberg, and N. V. Zvinogradskiy. Vibrations of a Heavy Shaft With [Uniformly] Distributed Mass and Clearance in One Bearing 68

AVAILABLE: Library of Congress

Card 3/3

VK/dwm/ec
12-19-60

VASIL'YEVA, R.V., inzh.; GUSAROV, A.A., kand.tekhn.nauk; DIMENTBERG,
F.M., doktor tekhn.nauk; TSEK'ANSKIY, K.R., inzh.

Experimental balancing of a flexible shaft in a model unit.
Vest.mash. 40 no.9:27-31 S '60. (MIRA 13:9)
(Balancing of machinery)

DEMENTIY, F.I.; GENTILE, K.T.; GUMENOV, A.A.; ZHITOMIRSKY, V.K.,
doktor tekhn. nauk, reценzent; DANILOV, I.N., inzh., red.

[Vibrations of machinery] Kolebaniia mashin. Moskva, Mashino-
stroenie, 1964. 307 p. (MIRA 17:8)

L 18451-66 EWT(m)/EWP(w)/ETC(m)-6 IJP(c) WW/EM
ACC NR: AP6002561 SOURCE CODE: UR/0286/65/000/023/0057/0057

AUTHORS: Gusarov, A. A.; Gorshkova, I. N.; Mayorov, Ye. G. 47
E

ORG: none

TITLE: Device for signaling the unbalance of rotating bodies. Class 42, No. 176712
176712 [(announced by Scientific Research Institute of Chemical Machine Construction (Nauchno-issledovatel'skiy institut khimicheskogo mashinostroyeniya)]

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 23, 1965, 57

TOPIC TAGS: turbine rotor, compressor rotor, laboratory instrument

ABSTRACT: This Author Certificate presents a device for signaling the unbalance of rotating bodies, e.g., a rotor, which consists of a detector placed on the body, power units connected to the detector, a control relay, and signal lamps. To determine the direction of deflection of the rotor under the action of nonequilibrium centrifugal forces, the detector is in the form of an annular cavity partially filled with a conducting liquid (see Fig. 1). A number of contacts are mounted

Card 1/2

UDC: 62-251.783.2 2

L 18451-66

ACC NR: AP6002561

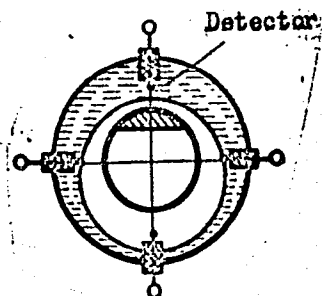


Fig. 1

radially in the cavity at an angle to each other. Orig. art. has: 1 diagram.

SUB CODE: 13/ SUBM DATE: 19Feb65

Card 2/2 mgs

SAKHIN, S. I., kand.tekhn.nauk; SHCHEGOLEVA, A.M., inzh.; GUSAROV, A.D.;
DUBINA, Ye.M.

Separate and simultaneous effect of molybdenum and tungsten on
the temper brittleness and hardenability of steel. Metallovedenie
2:104-122 '58. (MIRA 13:9)
(Steel alloys--Heat treatment) (Molybdenum) (Tungsten)

GUSAROV, A.D., kand.tekhn.nauk; KENDAL', M.D., inzh.

Using hydraulic machinery in working and transporting cohesive
soil of the overburden. Mekh. stroi. 17 no.12:3-5 D '60.
(MIRA 13:12)

(Hydraulic machinery) (Earthwork)

GUSAROV, A.D., kand.tekhn.nauk; PETROV, Yu.M., inzh.

Study of the basic parameters of hydraulic conveying of chalk
under winter conditions. Sbor. trud. NIIZHelezobetona no.3:
124-133 '60. (MIRA 15:2)

(Chalk) (Hydraulic conveying)

GUSAROV, A.D., kand.tekhn.nauk; MEL'NIKOV, Yu.F., inzh.

The problem of hydraulic transportation of clay. Sbor. trud.
NII Zhelezobetona no.7:155-163 '62. (MIRA 16:1)
(Clay--Transportation) (Hydraulic conveying)

BERNSHTEYN, L.A.; GUSAROV, A.D.

Hydraulic conveying of slurry made of plastic cement raw material.
TSent 28 no.1:16-18 Ja-F '62. (MIRA 16:5)
(Hydraulic conveying) (Cement)

GUSAROV, A.D., kand. tekhn. nauk

Hydraulic transportation of highly plastic soil from excavators.
Sbor. trud. NIIZHelezobetona no.8:90-94 '63 (MIRA 18:1)

L 65286-65 EWT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l)

ACCESSION NR: AP5019727

UR/0101/65/000/004/0001/0009
666.940:622.647.7

AUTHORS: ^{44 55} Gusarov, A. D. (Candidate of technical sciences); ^{44 55} Doshko, Yu. I. (Engineer); ^{44 55} Kuchma, L. Kh. (Engineer)

TITLE: ^{44 55} Determining the rheological characteristics of raw slurries and suspensions required for calculating hydrotransporting systems ¹⁴

SOURCE: Tsement, no. 4, 1965, 7-9

TOPIC TAGS: transport process, pipe flow, construction material / RV 8 rotational viscosimeter ²⁸

ABSTRACT: The study of plastic and strength properties of raw slurries presents the possibility of controlling the measurement of their structural composition. A series of tests revealed that laminar flow is most economical for suspensions of high concentration flow characterized by low relative velocities. The use of the RV-8 rotational viscosimeter is discussed and evaluated in the light of tests involving cement products. It is stated that the accuracy of measurement with the RV-8 decreases with increasing concentration of suspensions. Data showing the effective viscosities of argillaceous and chalk suspensions of the Belgorod Cement Factory are shown for the purpose of comparing the RV-8 measurements with

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ACCESSION NR: AP5019727

those obtained through the use of head loss curves in pipes of selected diameters. The quantitative characteristics of the mechanical properties of suspensions were determined according to the head loss relationship $I = f(V)$ with the use of both commercial and laboratory pipes. The results of the tests are shown graphically. The working equation of the curves is

$$P = f(V),$$

where $P = \Delta P R / 2l$, and $V = 4Q / \pi R^3$. P is the tangential stress at the pipe wall in dynes/cm²; ΔP is the pressure drop; V is the velocity gradient at the same points; R is the pipe radius (cm); and Q is the suspension flow volume (cm³/sec). The authors recommend that the data presented be applied to commercial applications of transporting suspended solids. Orig. art. has: 2 tables and 1 figure.

ASSOCIATION: Orgproyekttsenent

SUBMITTED: 00

ENCL: 00

SUB CODE: ME, ME

NO REF SOV: 003

OTHER: 000

Card 2/2 *MLB*

GUSAROV, A.D., kand. tekhn. nauk; DOKLADY, No. 1, 1965, p. 1, 2, 3, 4, 5.

Determining rheological characteristics of new cements and admixtures indispensable in the calculation of hydraulic transportation systems. TSement 31 no.4:7-8 31-Apr 65. (JL 1 19:2)

1. Vsesoyuznoye gosudarstvennoye spetsial'noye byuro po provedeniyu puskovo-maladozhnykh i proyektno-konstrukterskikh rabot v tsementnoy promyshlennosti Gostinoyu 1965.

GUSAROV, A. D.

GUSAROV, A. D. --"Effectiveness of Structural Drainages in Alluvial Structures."
*(Dissertations for Degrees in Science and Engineering Defended at USSR Higher
Educational Institutions) Min of Higher Education USSR, Moscow Peat Inst, Moscow, 1955

SO: Knizhnaya Letopis', No. 25, 18 Jun 55

* For Degree of Candidate in Technical Sciences

GUSAROV, A. I.

GUSAROV, A. F. and A. I. KUZNETSOV.

Moskovskomu Aviatsionnomu Institutu im. Sergo Ordzhonikidze - 10 let.
(Tekhnika vozdushnogo flota, 1940, no. 9, p. 16-19)

Title tr.: The Moscow Aeronautical Institute, named after Sergo
Ordzhonikidze, is ten years old.

TL504.T4 1940

SO: Aeronautical Sciences and Aviation in the Soviet Union, Library of
Congress, 1955.

AUTHORS: Gusarov, A. K., Pankrushin, V. K. S/006/60/000/03/003/019
B007/B123
TITLE: On the Application of the Method of Measuring Angles in Sets
PERIODICAL: Geodeziya i kartografiya, 1960, Nr 3, pp 21 - 25 (USSR)

TEXT: The present paper refers to an article by B. M. Rubis published in the periodical "Geodeziya i kartografiya", 1959, Nr 1. B. M. Rubis demands that the application of the method of measuring angles in sets be prohibited for observations at triangulation points of the second order, and that it should be restricted at points of the third order. Based on the experience gained in the Novosibirskoye AGP (Novosibirsk Aerogeodetic Enterprise) it is shown that B. M. Rubis is wrong. The observers N. F. Shishayev, Yu. A. Bykov, I. G. Dement'yev, and N. A. Dragovich are mentioned. For observations with changing sight conditions in some directions the method suggested by N. V. Yakovlev (Ref 1, footnote on p 23) is recommended. In order to confirm the arguments in favor of this method Professors D. A. Kuleshov (Ref 2, footnote on p 24) and K. L. Provorov and Docent A. A. Vizgin (Ref 2, footnote on p 24) are cited. Based on the explanations made here the following is noted and suggested:
1) When observing points of continuous triangulation nets by means of the method of measuring angles in sets the results obtained show the same accuracy as when observing angles in all combinations. However, it saves time, and the successive

Card 1/2

On the Application of the Method of Measuring Angles in Sets S/006/60/000/03/003/019
B007/B123

adjustment is simpler when applying the former method. 2) Experience gained from setting up continuous triangulation nets of the second and third order - more than half the points of the second order and all points of the third order being observed by the method of measuring angles in sets - showed that the accuracy achieved met the demands of the mapping phase. 3) For setting up triangulation nets the most economical methods must be used in order to prevent superfluous work. One of the ways would be to apply to a large extent the method of measuring angles in sets and the method of "incomplete observations" for observations at triangulation points of the second order. 4) The development of new methods used to measure horizontal angles must be continued, the solution being found in uniting the method in all combinations with the method of measuring angles in sets. 5) The question of reducing the number of observations to nine for observations of triangulation points of the third order should be considered. There are 1 table and 3 Soviet references.

Card 2/2

KLYUCHEROV, A.P.; KONDRAT'YEV, S.N.; Prinimali uchastiye: GUSAROV, F.V.;
UDOVENKO, V.G.; PETROV, G.A.; BURKSER, V.Ye.; SHMONIN, I.A.;
KUDRIN, Ye.A.; GALAKHMATOV, S.N.; ZIMINA, L.P.; SHISHARIN, B.H.;
KONDYURINA, R.V.; BURMISTROV, K.A.; SHIRNIN, I.A.; SIMONENKO, F.N.;
GORSHILOV, Yu.V.; KOLPAKOV, B.V.; GUSAROV, A.K.; BOLOTOV, P.G.

Heat insulation of open-hearth furnace crowns. Metallurg 5 no.11:
14-17 N '60. (MIRA 13:10)

1. Nizhe-Tagil'skiy metallurgicheskiy kombinat.
(Open-hearth furnaces---Design and construction)
(Insulation (Heat))

ZAKHAROV, A.F.; PETROV, G.A.; NOVIKOV, M.D.; POPOV, L.P.; TORSHILOV, Yu.V.;
GOLOKHMATOV, S.N.; GUSAROV, A.N.; KOVAL'CHUK, N.P.

Potentialities for increasing labor productivity in the
open-hearth process. Stal' 21 no.6:560-562 Je '61. (MIRA 14:5)

1. Nizhne-Tagil'skiy metallurgicheskiy kombinat.
(Open-hearth furnaces—Equipment and supplies)

POSTNIKOV, G.A.; GUSAROV, A.S.

Automatic drop lip of aprons on horizontal copper converters.
TSvet.met. 33 no.1:85 Ja '60. (MIRA 13:5)

1. Sredneural'skiy medeplavil'nyy zavod.
(Converters)

EORISOV, Yu.A.; GUSAROV, A.V.; GOROKHOV, L.N.

Mass-spectrometric study of the evaporation of cesium superoxide.
Teplofiz. vys. temp. 2 no.3:487-489 My-Je '64. (MIKA 17:8)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

ACCESSION NR: APL044519

S/0294/64/002/004/0535/0539

AUTHORS: Gusev, A. V.; Gorokhov, L. N.

TITLE: Determining mass-spectra of associates and their relative quantity in vapors of nonvolatile substances

SOURCE: Teplofizika vyssokikh temperatur, v. 2, no. 4, 1964, 535-539

TOPIC TAGS: mass spectrum, vapor pressure, orifice outflow, monomer, cesium ion current/ MS 3 mass spectrometer

ABSTRACT: A uniform temperature method was used to determine the mass-spectra and composition of associate vapors as in the case of a monomer-dimer pair. Two types of effusive flow systems were used. The first consisted of two compartments stacked vertically and separated by a small orifice. The top chamber was filled with saturated vapor of a monomer-dimer pair with pressures p_m and p_d respectively. The bottom chamber contained an unsaturated vapor effusing through the orifice between the two compartments. To determine the individual mass-spectra and the composition of the vapor, the initial ion current was measured in both chambers. To minimize stability problems in the above method, a second system was used where the two chambers were connected horizontally through an orifice and the ion current was measured in both chambers.

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ACCESSION NR: AP4044519

rents were recorded simultaneously from two other orifices, one on each chamber. A MS-3 mass-spectrometer was used with special shutters to record consecutively the molecular beams from both orifices. An acceleration potential of 2.4 kilovolts and ionization potential of 75 volts were used with 1 ma current emission. The orifices were calibrated using cesium iodide vapor, with an efflux ratio $S_a/S_c = 1.23$ and the pressure ratio p_d/p_m determined subsequently. The mass-spectra of NaCl and CsJ vapors were recorded successfully using the above method. The relative intensities of Na^+ , $NaCl^+$, Na_2Cl^+ , Cs^+ , J^+ , CsJ^+ , and Cs_2J^+ were determined in the experiment. Orig. art. has: 6 formulas, 3 figures, and 2 tables.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: 12Feb64

ENCL: 00

SUB CODE: CC, OP

NO REF SOV: 006

OTHER: 002

Card 2/2

GUSAROV, A.V.; GOROKHOV, L.N.

Determining the mass spectra of associates and their relative quantities in vapors over nonvolatile substances. Teplofiz. vys. temp. 2 no.4:535-539 J1-Ag '64. (MIRA 17:9)

1. Moskovskiy gosudarstvennyy universitet.

SHOSTAKOVSKIY, M.F.; ATAVIN, A.S.; TROFIMOV, B.A.; GUSAROV, A.V.; GLADKOVA,
G.A.

Interaction of mercaptans with cyclic acetals. Izv. AN SSSR, ser. khim.
no. 9: 1686-1687 S '64. (MIRA 17:10)

1. Irkutskiy institut organicheskoy khimii Sibirskogo otdeleniya
AN SSSR.

SHOSTAKOVSKIY, M.P.; LITVIN, A.A.; TROFIMOV, V.I.; ...

Reaction of 2-methyl-1,3-dioxoline with hydrogen chloride, 1965.
AN SSSR. Ser. Khim. no.6:1072-1074 '65.

(MIRA 18:6)

1. Irkutskiy Institut organicheskoy khimii Sibirskogo otdeleniya
AN SSSR.

ACC NR: AT7011648

SOURCE CODE: UR/0000/66/000/000/0001/0007

AUTHOR: Yazdovskiy, V. I.; Tsitovich, S. I.; Agre, A. L.; Gusarov, B. G.;
Sinyak, Yu. Ya.; Chizhov, S. V.

ORG: none

TITLE: Transformation of wastes in a closed ecological system

SOURCE: International Astronautical Congress. 17th, Madrid, 1966. Doklady.
no. 10. 1966. O transformatsii produktov zhiznedeyatel'nosti cheloveka i
biokompleksa pri osushchestvlenii krugovorota veshchestv v malykh zamknutykh
prostranstvakh, 1-7

TOPIC TAGS: life support system, metabolic waste, closed ecology system

ABSTRACT:

Successful operation of life-support systems based on partial recycling of substances depends on mineralization of human wastes and other life-support system byproducts, such as refuse from the space greenhouse, garbage, etc. Biological, physical and chemical methods of mineralization can be used alone or in combination. Criteria for judging the efficiency of these methods include the completeness of mineralization, the degree of change in chemical composition and aggre-

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ACC NR: AT7011648

gate state of the products, the coefficient of return of substances to the cycle, the weight and dimensions of equipment, the expenditure of energy, and the toxicity of end products.

The high-temperature and catalytic oxidation methods are most suitable for mineralizing solid and dehydrated human waste and life-support system refuse. The high-temperature method is technologically simple, but requires a temperature of 700—800°C. However, it mineralizes nearly all wastes, producing ash and gaseous products (CO₂, sulfur oxides, etc.). Within a range of combustion regimes the mineral composition of the ash is fairly constant, although its physical and chemical properties may change. One disadvantage of the high-temperature method is the possibility of forming free nitrogen, which must be bound (with additional energy expenditure). It should be noted that some type of high-temperature mineralization must be included in a life-support system because this step burns up the end-products of other forms of processing. This method can be successfully used in partially closed systems.

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ACC NR: AT7011648

The catalytic oxidation method of mineralization requires comparatively little energy and produces an acid solution useful for dissolving ash and treating nutrient media for autotrophs. Lower initial temperatures (200°C are required, and the ash formed by this mineralization process is more suitable for further processing. However, experimental conditions must be strictly controlled and long-acting, stable catalysts must be found. The catalytic oxidation method can be advantageously combined with the high-temperature method previously described. This combination can be used in partially closed systems, when the desired end-product is solutions of mineral salts.

The "pressure-cooking" method (oxidation of wastes in the liquid state) utilizes high pressure and high temperature and can be used to mineralize liquid human wastes, diluted urine-fecal mixtures and plant residue. This complicated method deserves more study because it produces a solution of mineral salts directly. Owing to the variety of organic substances subjected to mineralization, it is difficult to obtain a solution of constant composition. Experimental investigation of this self-sustaining exothermal process showed 90% minerali-

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ACC NR: AT7011648

zation of urine-fecal and fecal mixtures. Unfortunately, the remaining unidentified organic substances are very toxic for plants and must undergo additional processing. Traces of hydrogen, saturated and unsaturated hydrocarbons, and ammonia are found in the vapor after mineralization. Furthermore, the high pressure (150 atm) and temperature (250—275°C) required make this method technologically difficult. A possible use for this method is high-temperature hydrolysis of urea, producing ammonia and nitric acid. More research is required to determine the place of the "pressure cooking" method in a complex life-support system.

An aerobic method was selected to demonstrate biological mineralization. Biological mineralization can be intensified by (1) increasing the total number of microbes by regenerating the activated sludge, (2) increasing oxygen utilization by prolonging contact of the mixture with air (without increasing the length of aeration), or (3) by using higher temperatures during cultivation of activated sludge. Long-term experiments were conducted with a concentrated (1:30) urine-fecal solution aerated for 4 hr, with the

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ACC NR: AT7011648

following results: 85% mineralization of organic substances and 95% conversion of nitrogen-containing substances into nitrates.

Gaseous products of waste mineralization must be converted into solid or liquid form for use as plant nutrients. With the catalytic method of mineralizing gaseous substances, oxides of nitrogen and sulphur, CO_2 , and water are obtained. Mineralization of a daily amount of solid and liquid human wastes produces as much as 3.0—4.0 g of free nitrogen, 0.5 g of hydrogen, 3.0 g of carbon monoxide, 7.0 g of ammonia, and as much as 5.0 g of saturated and unsaturated hydrocarbons. During this process, as much as 122 g of CO_2 can be formed and 60 g of oxygen expended. The end product, after mineralization and purification, must contain only nitrogen, oxygen, and CO_2 .

Mineralization of human and plant wastes is closely connected with the regeneration, conditioning, and storage of water. Water sources are water-containing products of human metabolism and life-support system operation, a condensate of atmospheric moisture, and water of transpiration. A water-regeneration system weighs 20—

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ACC NR: AT7011648

50 kg regardless of flight duration, while a water supply for three men on a 30-day spaceflight can weigh 495 kg. One man requires approximately 4 liters of water per day, of which 1200 ml is drinking water, 1000 ml is needed for food preparation (more for dehydrated food), and 1800 ml for hygienic needs. Sufficient water for these purposes can be supplied by atmospheric moisture, urine, water left from washing, water of transpiration from higher plants, and algal substrate. The most promising methods for regeneration of water from human metabolic wastes are catalytic oxidation, vacuum distillation, and lyophilization. Lyophilization or molecular drying utilizes the vacuum and low temperatures of space. Studies have shown that water can be purified with sorbents (including ion-exchangers) if organic substances are oxidized first and semipermeable membranes are used. A number of other methods can be used for regeneration of water—electrochemical methods, ultrasound, radiation, and ozonation. Hygienic and chemical properties of water regenerated by lyophilization, vacuum distillation and catalytic oxidation are listed. These data show the need for additional purification by sorbents in some cases.

Orig. art. has: 1 table. [ATD PRESS: 5098-F]

SUB CODE: 06 / SUBM DATE: none

Card 6/6

S/190/60/002/009/019/019
B004/B060

AUTHORS: Patrikeyev, G. A., Gusarov, B. G., Konoplev, V. I.
TITLE: Brittle Rupture of Polymers in High-elastic State
PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 9,
pp. 1438-1439

TEXT: Polymeric material weakened by incisions is bound to undergo a brittle rupture at the incised spot at low temperatures and a certain critical elongation rate. The authors checked this assumption by a dynamometer and an МПО-2 (MPO-2) loop oscilloscope which allowed for elongation rates to be measured up to $2 \text{ m} \cdot \text{sec}^{-1}$. In natural rubber, the tearing strength was found to be considerably reduced at an elongation rate of over $0.7 \text{ m} \cdot \text{sec}^{-1}$ and temperatures of $-20 \pm 5^\circ \text{C}$. At this rate, a brittle rupture occurred at -60°C . Figs. 1 and 2 show the experimental data. The authors recommend the application of tearing strength tests at high elongation rates. The need is felt of an improvement in inertialess dynamometers. There are 2 figures and 2 Soviet references. ✓

SUBMITTED: June 11, 1960
Card 1/1

ACCESSION NR: AT4037681

S/2865/64/003/000/0089/0103

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TITLE: The recycling problem under prolonged spaceflight conditions

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy kosmicheskoy biologii,
v. 3, 1964, 89-103

TOPIC TAGS: manned space flight, life support, closed ecological system, waste
recycling, respiration, toxicology; algae, nutrition, photosynthesis

ABSTRACT: Biological recycling of wastes on spaceships can utilize both aerobic
and anaerobic methods. Apparently liquid wastes can be processed by means of
aerobic oxidation, while solid wastes require anaerobic methods. The advantages
of the aerobic method are: the high speed of processing in an aerotank, oxidation
of organic substances down to CO_2 , and the ability to control the speed of the
process by means of regulating the rate of oxygen flow. The disadvantage of this
method is the large amount of oxygen required. The advantages of the anaerobic
method consist of the absence of large air requirements and a small energy require-
ment. The disadvantages of this latter process are the slow rate of processing

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and the production of a large amount of harmful gases, particularly methane, making the mixture explosive. Another method which can be utilized in a closed ecological system is a biological method of processing wastes with participation of photosynthesis of algae. The advantage of this method is that it takes place in the light, and the oxygen required for bacterial oxidation of organic substances is obtained from the photosynthetic activity. Bacterial mineralization of organic substances is accompanied by photosynthetic building up of cell bodies of the algae. Consequently, this process involves the utilization of substances contained in human and animal wastes for obtaining algae which can, in turn, serve as a source of food for man and animals. The following are the chief disadvantages of the above indicated biological methods: small probability of complete recycling of wastes; the difficulty in obtaining products which are qualitatively and quantitatively constant; the uncertainty of adaptation on the part of microorganisms to unknown space-flight conditions (the possibility of mutations, etc.); the difficulty in controlling the rate of the processes; and the possibility of the appearance and accumulation of toxic by-products. Physicochemical methods of waste recycling can also be used. By means of these methods, it is possible to separate the soluble from the insoluble parts, extract useful substances from solvents, provide for combustion of insoluble substances to obtain gases and solids, and synthesize the gases and solids into required substances. Recycling of wastes based on

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physicochemical methods can include the following: extraction of substances from wastes which can be used directly, mineralization of organic substances, obtainment of products of definite chemical composition from ash and gases, and synthesis of nourishing solutions. The recycling of carbon and nitrogen in a closed ecological cycle can be performed by physicochemical processes. CO₂ gas exhaled by man can be used directly by plants. Soluble carbon compounds can also be utilized by plants for nourishment. Insoluble carbon compounds can be transformed into CO₂ by means of heat treatment. The CO₂ thus obtained can either be stored for supply purposes or can go directly to the greenhouse. Nitrogen products found in wastes can be extracted and used for feeding plants and possibly even animals. The remaining nitrogen compounds can be used for mineralization, which can be accomplished by various physicochemical means. An outline of such a scheme utilizing physicochemical processes can include the following: a unit for the collection of wastes, from which the products proceed to a second unit where those that can be utilized by man or other living organisms are extracted directly. The remaining substances proceed to a mineralization unit. While the gases produced during the mineralization process are trapped and separated, the insoluble inorganic salts are transformed into soluble ones in the next unit. Part of them go to living organisms while the remainder go to a unit for obtaining inorganic compounds. The by-products thus obtained are then converted into nourishing mixtures.

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At the present time it is difficult without experimental data to make a precise evaluation of this type of cycle, but it is possible to estimate the weight of such a cycle as 400 to 500 kg for a crew of five. Even if this weight were to be doubled, it would still be considerably less than the required weight of mineral salts for green houses in a life-support system based on stored supplies. A good recycling system should have the following characteristics: a minimum system of units necessary for processing wastes, use of common processes for transformation of elements contained in wastes into definite compounds, a maximum rate of processing these products, the inclusion of only those substances which are involved in the recycling. In addition to the above, it should have the following characteristics: minimum weight and size, minimum energy requirements, simple reliable construction, use of stable and highly resistant materials, means of preventing toxic substances from seeping out into the space cabin, and absence of processes not required for recycling. A comparison of biological methods, on the one hand, and physicochemical methods, on the other, shows that the latter have a number of advantages, including the possibility of complete recycling of wastes, short duration of the recycling process, the possibility of obtaining separate substances and required nourishing solutions of predetermined composition, and the use of processes which are widely used in chemical engineering. The disadvantages include high energy utilization and complexity of equipment. However, these are offset, to

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a certain extent, by the use of solar energy and the latest materials and methods of physicochemical processing. It should be noted that each mission requires the recycling of only those products required by that mission. This means that, in some cases, life-support systems will require only the regeneration of water. The fact that physicochemical processing has been very well studied in comparison to biological processing makes it probable that physicochemical recycling will be used in the first experimental closed ecological systems. However, it should be borne in mind that the optimum system of utilization will be based on the use of biological as well as physicochemical processes.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: PH, LS

NO REF SOV: 022

OTHER: 008

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11.11
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of radon fission. [with summary in English]. Gig. i san. 23
no.10:10-16 0 '58 (MIRA 11:11)

1. Iz I Moskovskogo ordena Lenina meditsinskogo institut imeni
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(AIR,

natural radioactivity determ. by radon fission
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(RADIUM, radon fission prod. in determ., natural
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S/000/01/010/001/001/011
B006/B066

21.8100 (1033,1138,1570)

AUTHORS: Gusarov, I. I., Lyapidevskiy, V. K.

TITLE: Determination of Inhaled Doses of Radon Decay Products

PERIODICAL: Atomnaya energiya, 1960, Vol. 10, No. 1, pp. 64-67

TEXT: A new method is suggested for determining the inhalation of radon decay products. The method is based on the counting of alpha particles per liter of air, which are produced by a complete decay of radon daughter products. In view of its relative exiguity, beta activity is neglected. The amount of energy released by a complete decay of the α -active atoms contained in 1 liter of air is given as $E_1 = a(ERaA + ERaC) + (b+c)ERaC'$.

where a, b, and c are the numbers of RaA, RaB, and RaC atoms, respectively, per 1 l of air; ERaA and ERaC are the energies released per decay of the respective element. Denoting their mean value by E_α , one obtains: E_2

$= E_\alpha(2a+b+c) = E_\alpha n$, where n is the number of alphas produced per l of air.

The error due to averaging is insignificant. If it is further assumed

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Determination of Inhaled Doses of Radon
Decay Products

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that the absorption coefficient η is equal for all inhaled radon decay products, $E = \eta n E$ will hold. In addition to the commonly accepted filter method, there are some other methods available for the determination of the unknown n : Supposing that for a certain pumping rate v , the number n_p of alphas recorded per unit time remains constant within a long time interval, the number of radioactive atoms will remain constant within the time Δt of this interval, that is to say, the number of radioactive atoms retained by the filter during the time Δt is equal to the number of atoms decaying in the same time. In the time Δt , exactly 1 l of air is to be pumped through the filter. For RaA, RaB, and RaC, the number of atoms retained by the filter is $\varphi_1(a+b+c)$, where φ_1 is the known filtration efficiency. The total number of decay events is $\varphi_1(2a+b+c) = \varphi_1 n$ and, thus, n is equal to $n_p / v \varphi_1 \varphi_2$, where φ_2 is the recording efficiency; the counting rate n_p is expressed in pulses/min; v is given in l/min. A device with continuous recording of the alphas emitted by the filter was developed by the authors jointly with A. M. Konstantinov for dose measurement by this

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Determination of Inhaled Doses of Radon
Decay Products

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method. This device was used for two series of experiments, the first of which corresponded to a short-period exposure of the organism to a contaminated atmosphere, whereas the second series corresponded to a longer exposure, in which radioactive substances are concentrated in the organism. This concentration differs from the concentration of these substances in the atmosphere. On account of the fluctuations in time of the quantities of substances contained in the air, simultaneous measurements were made with two devices of the same type. The number of α -particles recorded in a complete decay of the daughter products proved to be largely independent of the method applied and of the concentration ratio of daughter products. The radon concentration may be determined from the number of recorded alphas. Fig. 2 shows accumulation and decay curves of daughter products retained by filter 1 and filter 2 (for $v = 151/\text{min}$, $A = 11$). The authors thank A. V. Bykhovskiy, M. S. Kozodayev, and Ye. V. Shchepot'yeva for discussions, and A. A. Titov for assistance in measurements. There are 2 figures and 3 references: 2 Soviet and 1 US. x

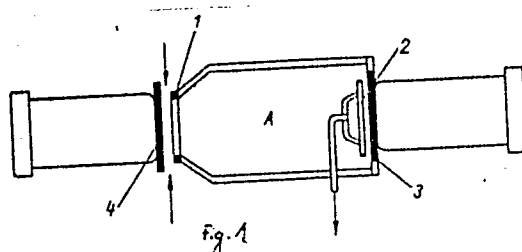
SUBMITTED: January 12, 1960

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Legend to Fig. 1: 1), and 2) filters; 3), 4) scintillation counters; the arrows indicate the direction of air movement

Legend to Fig. 2: n_p - counting rate, t - pumping time



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GVISAROV, I.I.

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1. Iz kafedry obshchey gigiyeny I Moskovskogo ordena Lenina
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(RADIOACTIVITY)